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Practical experiences with the implementation of the Energy Performance Buildings Directive in Central Europe

A project in behalf of Government of the Federal Republic of Germany

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ENERGY PERFORMANCE BUILDING DIRECTIVE

European Parliament and the council announced on 16 December 2002, the Directive 2002/91/EC (Energy Performance Building Directive, EPBD). The European countries were asked to implement the EPBD within a time period of 3 years. If the needed experts are not available, a further transition period of two more years is allowed. According to this plan, all European countries should have the EPBD implemented by end of 2008 at the latest.

The main issues, the European nations have to implement according to EPBD are:

- Article 3: Member States shall apply a methodology, at national or regional level, for calculation of the energy performance of buildings
- Article 4: Member States shall take the necessary measures to ensure that minimum energy performance requirements for buildings are set, based on the methodology referred to in Article 3.
- Article 5: Member States shall take the necessary measures to ensure that new buildings meet the minimum energy performance requirements referred to in Article 4.
- Article 6: Member States shall take the necessary measures to ensure that when buildings with a total useful floor area over 1 000 m2 undergo major renovation, their energy performance is upgraded in order to meet minimum requirements in so far as this is technically, functionally and economically feasible.
- Article 7/1: Member States shall ensure that, when buildings are constructed, sold or rented out, an energy performance certificate is made available to the owner or by the owner to the prospective buyer or tenant, as the case might be.
- Article 7/3 Member States shall take measures to ensure that for buildings with a total useful floor area over 1 000 m2 occupied by public authorities and by institutions providing public services to a large number of persons and therefore frequently visited by these persons an energy certificate, not older than 10 years, is placed in a prominent place clearly visible to the public.
- Article 10 Member States shall ensure that the certification of buildings, the drafting of the accompanying recommendations and the inspection of boilers and air-conditioning systems are carried out in an independent manner by qualified and/or accredited experts, whether operating as sole traders or employed by public or private enterprise bodies

INITIAL SITUATION GERMANY

Like in other European countries in Germany the implementation of EPBD was carried out under extremely high time pressure. But unlike in other countries, a discussion about operational and asset ratings started soon after the EPBD was ratified. It initially focused on housing, with a debate between the industry, environmental NGOs and professional engineers. Operational ratings were seen by the industry as an easy, inexpensive and quick solution if with limited insight due to the vagaries created by occupants. Asset ratings were criticised as too time consuming and expensive, an “income generation” programme for engineers and architects.

Proceedings of the Eighth International Conference for Enhanced Building Operations, Berlin, Germany, October 20-22, 2008

Eventually, at the end of 2005, the legislative process turned to non-domestic buildings. Realising that they had to create thousands of certificates for public display, the Public Authorities put pressure on the government to offer a simple certification method for non-domestic buildings based on an operational rating. A steering group was set up by the Ministry of Building to develop a draft operational rating methodology, and a draft law was published on 16 November 2006. The law was finally passed on 24 July 2007 as an amendment of the German "Energieeinsparverordnung" (EnEV)

The debate between asset and operational rating was carried out mainly on a political level. A scientific based discussion on suitable methodologies to calculate energy performance of buildings was under these circumstances nearly impossible.

To improve the objectification of the political discussion for the next revision of the German legislation ("Energieeinsparverordnung"), the German governments initiated a survey to compare the practical experiences with EPBD in the neighbouring countries.

PROJECT AIM

The project shall deliver a systematic comparison of practical experiences with EPBD implementation in the nine neighbouring countries. With partners in each country, detailed information on the legislation, methodologies, designs, education and accreditation of experts and costs has to been gathered. The focus will be on already existing practical experiences. The result should make a contribution to an objective discussion for the next revision of EPBD legislation in Germany. Therefore a clear presentation of the results is desired.

PARTICIPATING COUNTRIES

The project started with the precipitation of the following countries:

Austria
Belgium
Czech Republic
Denmark
France
Great Britain
Germany
Netherlands
Poland
Sweden

Meanwhile Luxembourg and Slovakia has been added.

SCHEDULE AND PROJECT STEPS

Phase 1

November 2007 – January 2008
- Project conception
- Collection of existing information (EU-projects, national information sources)
- Preparation of the draft questionnaire
- Build-up of the project team (one partner in each country)Project conception, survey of existing information

Phase 2

February - June 2008
- Issuance of sub-contracts
- Installation of web page
- Installation of the database and the online questionnaire
- National information through the partners
- Questionnaire
- Translated example of certificates
- Overview legislation
- Relevant laws in national language
- Contact list of relevant persons
- Report of interviews with "players" of the different groups involved (owner, user, issuer, government, research)
- Processing and selection of information (handling of information, clear and concentrated summary)
- First interim report

Phase 3

July – September 2008
- Consolidation in 4 selected countries
- Focus on acceptance of the EPBD implementation in the countries
- Open questions from phase 2
- Interim report 2

Phase 4

October - November 2008
- Final report (English/ German)

TOP LEVEL QUESTIONS

The study will cover the whole implementation process, but due to the special interest of the German government, the following the following topic are declared as "Top level questions":

- Accreditation of experts
- On-site visit / web based certification
- Certification of buildings or/and building units
- Operational rating

ACTUAL PROJECT SITUATION

Since beginning of June, the preliminary results of the online questionnaire are available. The draft of the national reviews and the first interim report are finalized end of August. A second internal interim report will be available end of September. The final report is scheduled for end of November.

Due to the fact, that the following results are outcomes of an ongoing project, they are still preliminary and not completed totally.

FIRST RESULTS

1. Theoretical aspects of calculating energy performance

1.1. Methodologies

1.1.1 Level of integration

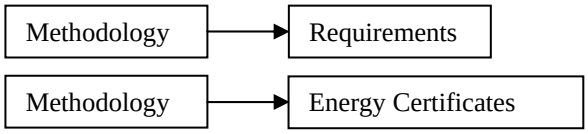
Due to the EPBD the methodology, which has to be developed in the countries has to be used to determine building requirements. In view of energy certificates is not explicitly written in the EPBD, that the energy certificate has to be based on the same methodology, but of course in the sense of transparency and simplification it is helpful to use as less methodologies as possible.

Different cases are possible:

1. Integrated Methodology

- The methodology is used for the definition of the building requirements
- The requirements are one of the required benchmarks in the energy certificates
- The energy certificate is also the basis for the building permission in new buildings

2. Disintegrated Methodologies



- For Requirements and energy certificates the same methodologies are not used
- The building permission is not given on the base of the energy certificate

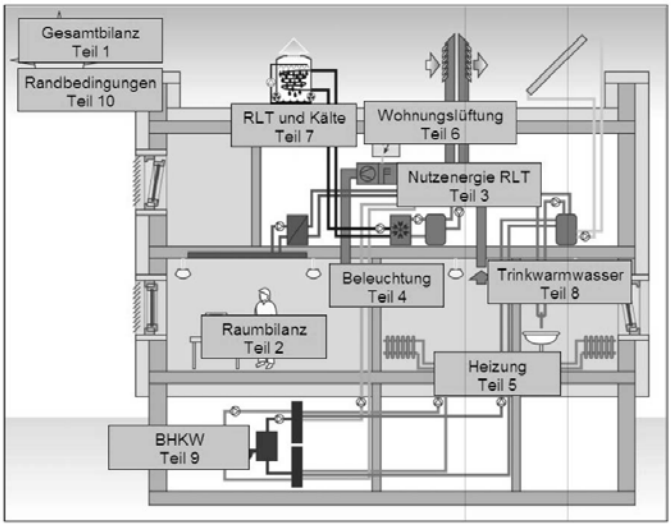
Like always in real life, different mix forms appear in the implementation in the countries.

1.1.2 Methodologies based on actual or estimated energy consumption

The EPBD energy performance is defined in a way, that methodologies are allowed on the base of the amount of energy which is actually consumed or estimated. Both strategies are used in the member states. According to CEN definition a methodology based on an estimated amount of energy is called “Asset Rating (AR)” and a methodology based on actually consumed energy is called “Operational Rating (OR).

Expressing energy performance with estimated energy demand (Asset Rating)

Picture 1 Energy balance in buildings



Baselines of calculating energy performance with estimated energy is described in EN 15603. According this standard, two approaches are allowed:

Holistic approach A holistic approach adding up the totality of the effects of the heat sink and sources from the building and system that are recoverable in the building, on the calculation of the building energy need. As the systems losses depends on the building energy use, which itself depends on the recovered system sources, iteration may be required. If the monthly method is used, the procedure is as follows, for each calculation step.

Factor approach A simplified approach in which the recovered system heat losses. Obtained by multiplying the recoverable system losses by a conventional recovery facto are directly subtracted from the loss of each considered sub-system at the system level. This will avoid iterations.

Generally speaking, the energy consumption is estimated by assuming a standard usage of the building. The calculation with standard use leads on the one hand to comparable result, on the other hand the standard use normally differs a lot in comparison with the actual consumption, which has to be explained to the public.

Expressing energy performance with estimated energy demand (Operational Rating)

Using the actual metered energy consumption as an expression of the energy performance could be done very quickly. But using actual metered energy, it must be taken into account, that the influence of the user and the usage of the building is included in the energy performance and that these factors might have a substantial influence on the energy performance. To improve that, usually the building stock is divided into different building types with similar usages.

Discussion of metered and estimated based energy performance

Table 1 Advantages and Disadvantages of metered and estimated based energy performance

	Estimated energy (AR)	**Actual metered energy (OR)**
Advantages	• Results are comparable without problems, independent of the actual usage in the building • energy savings according to the requirements can be calculated	• Quick to access • Describes the “real” consumption
Disadvantages	• Predictions not always will come true • Calculated energy demand does not comply with the actual consumption of the user. That might difficult to explain	• Influence of the usage of the building is included in the energy performance

1.1.3 Simplification of calculation models

Calculation the energy demand with a holistic approach sometimes is time consuming. Therefore several approaches exists, where on the base of the holistic approach simplifications has been implemented. This is meanly true for the existing buildings

1.2. Indicators

According to article 2, energy performance has to be expressed with one or more indicators. Due to the fact, that normally different energy sources are used in a building, this different energy sources has to be added to one global expression of energy performance. Different energy sources have different values in meaning of energy costs and in meaning of the environmental impact. Thus the choice of indicators includes the choice of a more ecological or an more economical orientated expression of energy performance.

Table 2 Different types of indicators

Indicator	**Description**	**Ecological/economical orientated**
End energy	Amount and sources of energy, which has to be delivered to the building	Economical
Primary energy	End energy plus energy with is needed for production this particular end energy source and for transportation of the energy to the building	Ecological
CO2	End energy multiplied with a CO2 factor, according to the energy source	Ecological
Political weighting factor	Different end energy sources are weighted with a factor. This factor is created according to the strategy of the national energy policy	Economical or Ecological, depending on the factors
Artificial factor	The indicator expresses an artificial number. Mostly the relation between actual energy demand and a typical energy demand.	Economical or Ecological, depending of the basic indicators

2. Summarized Comparison of EPBD Implementation

2.1. Methodologies to express Buildings Performance

2.1.1 Methodologies based on estimated and actually consumed amount of energy

The central European member states chose different methodologies to express the energy performance. At least, four different groups can be identified:

Table 3 The method of the following countries is based on:

Methodology used	Country	Remark
1. Only estimated energy	Austria Czech Republic Denmark Netherlands	
2. Mixture of both methods *metered energy for public buildings estimated energy for all other buildings*	Belgium United Kingdom	
3. Mixture of both methods *with exceptions free choice between estimated and metered energy*	France Germany	Exceptions see national profile
4. Only operational rating	Sweden	Special arrangement for new building

UK and Belgium use in principal also asset rating and operational rating which is chosen only for the relatively small part of the public display (public buildings). Taking this in mind, it get clear, that most counties use an asset rating based methodology for expressing energy performance. A matter of particular interest is the fact, that UK has reduced the validity of the public display certificate from ten to one year.

France and Germany are the nations, where owners under certain circumstances have the choice between the two methodologies.

It will be interesting to follow, how Sweden will solve the open issues, especially regarding the details of new building permission.

2.1.2 Overview on different methodologies in the nations

Only Austria, Czech Republic and Denmark so far have introduced the only one core methodology for all types of building (disregarded OR in Sweden) (high grade of integration). This makes the system much easier to explain and understandable and may help in the way to transparency. Austria lost this chance for transparency due to the regional responsibilities of the EPBD implementation. The described methodology is handled only as a guideline for the regional implementation.

Other countries like UK, Belgium, Netherlands and Germany based the development of the methodologies almost on already existing methodologies and implemented due to historical reasons more than one methodology.

The following key elements describe the methodologies:

Type of buildings	In general the following building types are used: Residential / Non Residential / Public building New building / Existing building Sometimes other factors like rented/sold or central / individual heating system are taken into account
Main indicator	Normally one indicator is chosen to express energy performance
Type AR/OR	As described before, two principle methodologies are available: the operational rating (OR) and the asset rating (AR).
AR time period	If the methodology based on a holistic AR, a time period for the calculation has to be determined (m=monthly, d=daily, h=hourly)
Usage	Basely the methodologies can be used for requirements and/or certificates
Energy sources	According to EPBD at least energy for heating, hot water, lighting, ventilation and cooling must to be taken into account.

Table 4 List of different methodologies applied in the countries

Nation	Number of national Methodologies	Types of buildings	Main indicator	Type (AR/ OR)	AR time period	Simplification	Usage	Eenrgy sources	Remarks
Austria	AUS1	New and existing RES and NON RES	EE	AR	m	yes	REQ CERT	EPBD	Simplification for existing buildings (default values for building components) Implementation responsibility of the Austrian countries, Methodology is a guideline
Belgium	BEL1	New buildings	E-level	AR	m	?	REQ CERT	EPBD	Implementation responsibility of regions the methodology in Wallon region differs slightly and is expressed in E_w-level
Belgium	BEL2	Existing buildings	E-Level	AR	m	yes	REQ CERT	?	
Belgium	BEL3	Public buildings		OR			CERT		Methodologies are still under development and will be different in the regions
Czech Republic	CZ1	All buildings	EE	AR	m	no	REQ CERT	EPBD	End energy for heat and electricity is added without any factor
Denmark	DK1	All buildings	Political factor	AR	m	?	REQ CERT	EPBD	
France	FR1	RES and NON RES depending special requirements	PE	AR	h	?	REQ CERT	EPBD	
France	FR2	RES and NON RES depending special requirements	PE	OR		no	CERT	EPBD	
Germany	DE1	RES asset	PE	AR	m	yes	REQ CERT	heat	It is planned to integrate RES and NON RES to on methodology Only heat and heat related consumptions
Germany	DE2	RES operational	EE	OR	-	no	CERT	EPBD	Only heat
Germany	DE3	NON RES asset DIN V 18599	PE	AR	m	yes	REQ CERT	EPBD	
Germany	DE4	NON RES operational	EE	OR	-	no	Cert	EPBD	
Great Britain (UK)	GB1	RES, Standard assessment procedure (SAP)	EE	AR	?	yes	REQ CERT	heat	Only heat and hot water, for all the other consumptions, default values are used, reduced dataset for existing buildings
Great Britain (UK)	GB2	NON RES, simplified Building Energy Model (SBEM)	CO2	AR	?	yes	REQ CERT	EPBD	Reduced dataset for existing buildings
Great Britain (UK)	GB3	Public buildings, DEC	CO2	OR	-	no	CERT	EPBD	
Luxem-bourg	LUX1								

Nation	Number of national Methodologies	Types of buildings	Main indicator	Type (AR/ OR)	AR time period	Simplification	Usage	Eenrgy sources	Remarks
Nether-lands	NL1	EPN, New buildings and major renovation	Artificial factor	AR	m	no	REQ CERT	EPBD	Additional guideline for the energy certificate necessary
Nether-lands	NL2	Simplified EPA, existing buildings	Artificial factor	AR	m	no	CERT	EPBD	
Nether-lands	NL3	Public buildings					CERT		Under development
Poland	PL1								Under development
Slovak Republic	SLO1								
Sweden	SE1	For all buildings	EE	OR	-	no	REQ CERT	EPBD	Energy performance is defined as the delivered energy to the building excluding the energy amount used by the users, tenants, occupiers. Until now, no clear regulation regarding this is published

2.2. Indicators to express energy performance

Due to the political wishes, different energy performance is expressed with different indicators

Table 5 Types of indicators used in the countries

Indicator	used by nation	Remark
End energy	Austria	No global indicator, Label with heat only, other energy source indicated separately for information only
	Czech Republic	Global indicator by adding end energy for heat and electricity without any factor
	Germany, operational rating	Only for the certificate, not for new buildings Two separate performance expression for heat and electricity
	Sweden	Global indicator by adding end energy for heat and electricity without any factor
Primary energy	Germany, asset rating	
	France	
CO2	UK	
	France	In conjunction with PE
Political weighting factor	Denmark	Global indicator, electricity is multiplied with factor 2,5 and heat with 1, no further factors (renewable, CHP etc) are used (near to primary energy)
Artificial factor	Belgium	Factor is based on primary energy
	Netherlands	Factor is based on primary energy

From these indicators, end energy is the only which has an economical relevance, whilst all the others are ecological based. All political weighting factors and artificial factors are calculated on the base of primary energy. Thus the indicators can be divided in two groups:

Economical orientated:
Austria
Czech Republic
Germany, operational rating
Sweden

Ecological orientated:
Belgium
Denmark
France
Germany, asset rating
Great Britain (UK)
Netherland

2.3. Requirements

On the base of the methodologies, requirements for new and existing buildings are described. In Table 4, the use of the different methodologies for requirements is marked.

All nations have requirements for new buildings. Again it is a sign of high integration, if the building permission is approved on the basis of the energy certificate. This is not always the case (Table 4).

The requirement for new buildings can be described as follows:

Global requirement: All countries have a global requirement on the base of the described methodology. But not always the global requirement covers all energy uses according to the EPBD.

Sub requirements: In addition to the global requirements, most countries defined different sub requirements.

Table 6 Requirements for new buildings

Nation	**Global requirement**	**Sub requirements**	**Remarks**
Austria	End energy< (heat only)	U-values, boiler/chillers, ventilation, pipe insulation,	
Belgium	E-level (ratio of PEact and PE req))	U-values K-level, overheating, ventilation, solar panels (Wallon Region)	Sub requirement solar panel is still not yet in force
Czech Republik	End energy (sum of EE heat and EE electricity)	U-values, boiler chiller	Eight building types with reference values (see energy certificate) new buildings has to be C and better
Denmark	Political weighted energy (heat =1 electricity=2,5)	U-values, boiler/chiller, ventilation	Two reference values (energy frames does exist, one for housing, student halls, hotel, etc; the other for non domestic buildings (including lighting)
France	Primary energy (CO2)	U-Values, boiler/chiller, ventilation, cooling, lighting	
Germany	Primary energy		Domestic buildings only heat and heat related electricity, Non domestic buildings including lighting, ventilation, cooling
Great Britain (UK)	CO2	U-values, boiler, chiller, ventilation, cooling, lighting, metering,	
Luxembourg			
Netherland	Artificial factor (base of PE)	U-Value	
Poland			
Slovak Republic			
Sweden	Metered energy		Building permission is proven two years after finalizing

2.3.1 Requirements for existing buildings

The requirement for existing buildings can be described as follows:

Major renovation (MR): The definitions for major renovation differ, but in most cases they are similar but not always the same.

Requirements (MR): Two situations has been found: Some countries treat major renovations like new buildings (NEW) others implemented special requirements (SPECIAL).

General requirements: Some countries also have additional requirements for all renovations implemented.

Table 7 Requirements for existing buildings

Nation	**Major renovation (MR), definition**	**Requirements (MR)**	**General requirements**	**Remarks**
Austria	Existent if the building has more than 1000 m² floor area, the whole renovation costs exceed 25% of the building value or if 25% of the building envelope is renovated or if 3 of the main components of a building (windows or front or roof or heating system	Special	No	
Belgium	Different definition in the regions	New	x	
Czech Republic	Buildings with more than 1000m2 of floor area that (1) at least 25 % of a surface area of a building envelope shall be reconstructed or (2) a change of building services systems causes at least 25 % change of total energy consumption.	New	no	
Denmark	The energy requirement for renovations is described in the building regulation. Note that regarding renovations there is no distinction in Denmark between buildings with an area below and over 1,000 m². Thus the requirements are in general valid for all buildings covered by the energy requirements.	Special	no	
France	Major renovation : this is the case when the cost of the renovation works are higher than 25% of the value of the building. Building costs are decided by national order (ex : 20 December 2007, cost for residential : 1287€/m2 ; for non residential : 1100€/m2	Special	yes	
Germany		New	no	
Great Britain (UK)	This regulation applies to a building with a total useful floor area over 1,000m2 where the proposed building work includes: a. an extension; or b. the initial provision of any fixed building services; or c. an increase to the installed capacity of any fixed building services	Special	no	
Luxembourg				
Netherland	A major renovation is defined by the fact whether or not a building permit is required	Special	no	
Poland				
Slovak Republic				
Sweden	No definition exists in Sweden			

2.3.2 Buildings permission

Time of building permission	In general two main points exists, where it makes sense to prove the energy performance of a new building or a major renovation: During planning phase and after completion of the building. Some countries ask for the building permission during the planning phase (as planned), other after the completion (as built) and others ask for both (both)
Prove of building permission	Due to the integration grade of the methodologies, prove of the buildings permission is done with the energy certificate or with a separate document.
General requirements:	Additionally some countries have implemented general requirements for all renovations independent from MR

The building permission procedure is handled different in the different nations.

Table 8 Overview on building permission procedure

Nation	**Time of permission**	**Prove of permission with**	**Remarks**
Austria	as build	Certificate	
Belgium		other	
Czech Republic	?	Certificate	
Denmark	Both	Certificate	
France		Certificate	
Germany	As planned	Certificate	
Great Britain (UK)		certificate	
Luxembourg			
Netherland		other	
Poland			
Slovak Republic			
Sweden	2 years after finalization	certificate	

2.4. Energy certificates

Mainly the energy certificates have to fulfil the requirement of the EPBD to express the energy performance in a transparent manner. The certificates can be described with the following key elements:

Methodology	AR or OR
Graphical display	The energy performance is expressed in each certificate with a graphical display based on the main indicator. This is done by using energy classes or an “energy speedometer” (Speedo)
Main Indicator	On the certificate energy performance is expressed with one or more main indicator
Additional information	In addition to the main indicator some countries provide additional information on the certificate

Naturally the types of certificates correspond closely with the methodologies. But in some countries due to different requirements for different buildings types, more than one certificated is based on one methodology.

2.4.1 Main elements of the energy certificates

	Types of certificates	**AR or OR**	**EP Speedometer**	**Main Indicator**	**Additional information**
Austria	RES and NON RES	AR	Classes	Heat	• Electricity demand (NON RES) Recommendations
	Public buildings	AR	Classes	Heat	• Electricity demand • Recommendations
	Other buildings (e.g. historical monument	AR	Classes	Heat	• Electricity demand • Recommendations
Belgium	New buildings (Flemish)	AR	Speedo	E-level	
	Existing dwellings	AR	Speedo	E-level	• Performance of envelope • Performance of heating system • CO2 emission • Recommendations
	New buildings (Brussels)	AR	Classes	PE	• Electricity consumtion • Fuel consumption • EP a E-Level • EP as K-Level • EP as CO2 Recommendations
Czech Republic	AR for RES and NON RES	AR	Classes	EE	Detailed energy protocol with • detail information on building envelop and equipment • actually consumed energy • specific energy price • Recommendations
Denmark	AR for RES	AR	Classes	Artificial factor	• Consumed energy • Recommendations
	AR for NON RES	AR	Classes	Artificial factor	• Consumed energy
France	Same general type for all buildings	AR OR	Classes	CO2 and PE	• End energy • Primary energy • Energy costs
Germany	RES	both	Speedo	PE/EE	• Recommendations
	NON RES / PUBLIC	both	Speedo	PE/EE	• Recommendations
Great Britain (UK)	RES (new and exist)	AR	Classes	CO2	• No
	NON RES (new and exist)	AR	Classes	CO2	• No
	PUBLIC	OR	Classes	CO2	• Energy history • Heat and electricity
Luxembourg					•
Netherlands					• Recommendations
Poland					•
Slovak Republic					•
Sweden	OR for all buildings		-	x	• Recommendations

2.4.2 Site visit

The quality and the value of the certificate depends strongly on the fact, whether the expert must do a visit of the building or not. On the other hand, a site visit needs time and overheads, which will increase the cost for the certificate.

A site visit includes the process of issuing the energy certificate in the following countries:

Nation	Site visit	Remark
Austria	Compulsory	Data collection can be made by the owner
Belgium	Mandatory	
Czech Republic	Compulsory	Certificates are usually made including a site visit, due to the detailed certificate detailed data are necessary, but it is not mandatory by law
Denmark	Mandatory	
France	Mandatory	Site visit mandatory, but in big residential housing areas, the certificate for the whole site can be done on the base of one single flat
Germany	Compulsory	Data collection can be made by the owner
Great Britain (UK)	Mandatory	Data collection can be made by the owner
Luxembourg	Compulsory	
Netherlands	Mandatory	
Poland	Mandatory	
Slovak Republic	Compulsory	
Sweden	Mandatory	

2.5. Recommendations

In the view of energy savings, recommendations are a crucial part of the certificate. Some nations point out, that the recommendation is the part of the certificate, which has the most impact and requires the most focus.

In general, all certificates include recommendations, except the UK, where the recommendation (advisory report) is part of a separate document, but is mandatory to issue.

The following key elements describes the type and quality of the recommendations

Issuer Recommendations can be done by an expert including a site visit or can be done automatically on the base of some basic information

Calculation of savings A recommendation can be made only as a recommendation of the savings in terms of energy and money can be calculated.

Degree of detail Are the savings assessed as a total sum or are the savings for each recommendation assessed by their one.

Table 9 Recommendations in the energy certificate

Nation	Issuer	Calculation of savings	Degree of detail	Remark
Austria	Expert	Savings	Sum	
Belgium	Automatically	No	No	
Czech Republic	Expert	Yes	Each	
Denmark	Expert	yes	Each	Energy plan crucial point of energy certificate
France	Expert	Yes	Each	
Germany	General	No	No	
Great Britain (UK)	Expert	No	No	
Luxembourg				
Netherlands				
Poland				
Slovak Republic				
Sweden				

2.6. Experts, Training and Accreditation

In the view of quality assurance a good qualification of the experts is an absolute precondition for high qualified certificates. The countries treat that topic with different engagement. Some have developed a well structured and organized qualification procedure; others handle this topic with less engagement.

Nearly all countries like to reduce the bureaucracy. Different approaches are implemented to shift the responsibility of the accreditation and the quality assurance from the government to private bodies.

2.6.1 Training

The following key elements describes the type and quality of the training

Supplier of training	Is a training organised by the government or private organisations
Curriculum	Is the curriculum established by the government and is it mandatory for the training.
Voluntariness	Is the training voluntary for the experts or do they have to join a training mandatorily.
Duration	The amount of training might be very different. It could be from several hours to several months.

Cost Average cost of training

Table 10 Overview on training

Nation	**Supplier**	**Curriculum**	**Voluntar-iness**	**Duration (days)**	**Remark**
Austria	Private		Vol	12	
Belgium	private		Depends	5	Different regulation in the regions and for different buildings
Czech Republic	Gover		Vol	1,5	
Denmark	private		Mand	5	
France	private		Vol		
Germany	private		Vol	3	
Great Britain (UK)	private		Vol		
Luxembourg					
Netherlands	private		Vol	2	
Poland					
Slovak Republic					
Sweden	private		Vol	5	

2.6.2 Accreditation

The following key elements describe accreditation procedure:

Accreditation — Does a accreditation system exist or are the experts defined in general by a certain education level. The accreditation can be gained by an individual or an organisation.

Organisation — Who carries out the accreditation?

Validity — How long is the accreditation valid

Nation	Accreditation	Organisation	Validity	Remark
Austria	Organisation			
Belgium	individual			
Czech Republic	individual			
Denmark	Organisation			
France	individual			
Germany	no			
Great Britain (UK)	individual			
Luxembourg				
Netherlands	individual			
Poland				
Slovak Republic				
Sweden	individual			

2.7. Quality assurance

The following key elements describe the quality assurance:

QA exists — Does generally a quality assurance system exist or not.

Organisation — Is the quality assurance carried out by the government or a private organisation (GOV/PRIV)?

Samples

Penalty

Nation	Quality assurance	Organisation	Samples	Penalty	Remark
Austria	No/Yes				Depends on regions
Belgium	No/Yes				Depends on regions
Czech Republic	Yes				
Denmark	Yes				
France	Yes				
Germany	no				
Great Britain (UK)	Yes				
Luxembourg					
Netherlands	Yes				
Poland					
Slovak Republic					
Sweden	Yes				

2.8. Data collection

In many countries the availability of data on energy consumption in buildings is rare. Issuing energy certificates for a large amount of buildings offers the chance to improve the national database to an certain step.

Nation	Central data collection	Remark
Austria	Yes	Planned for 2009
Belgium	Yes	Flemish region
Czech Republic	No	
Denmark	Yes	
France	Yes	In planning
Germany	No	
Great Britain (UK)	Yes	
Luxembourg		
Netherlands	Yes	
Poland		
Slovak Republic		
Sweden	Yes	

2.9. Financing overheads

Nations which have implemented accreditation, quality assurance and data collecting have to ensure the financing of these activities. In general the following approaches have been found:

Governmental organisation	Overheads are carried out by a governmental (paid) organisation
Governmental fee	Overheads are paid due a fee, which has to be paid for each certificate and is distributed by the government
Private fee	Government has given the carrying out and the amount of the fee totally to the market

Nation	Governmental organisation	Governmental fee	Private fee	Remark
Austria	**x**			
Belgium	**x**			
Czech Republic	**x**			
Denmark		**x**		
France	**x**			
Germany				
Great Britain (UK)			**x**	
Luxembourg				
Netherlands	**x**			
Poland				
Slovak Republic				
Sweden	**x**			

2.10. Acceptance

Acceptance is topic of phase 2. Results will be available in October

Ingo Therburg
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